

WHAT IS CLAIMED IS:

1 1. An isolated nucleic acid molecule comprising a sequence that encodes a
2 functional NRIF3 nuclear hormone receptor co-activator, wherein the NRIF3 binds in a ligand
3 dependent manner to thyroid hormone receptor (TR) and retinoid X receptor (RXR), but does
4 not interact with retinoic acid receptor (RAR), vitamin D receptor (VDR), progesterone receptor
5 (PR), glucocorticoid receptor (GR), and estrogen receptor (ER) in a yeast two hybrid assay
6 system or *in vitro*, or both, which polypeptide contains an LxxIL (SEQ ID NO:2) module in its
7 C-terminal domain.

1 2. An isolated nucleic acid according to claim 1, wherein said NRIF3 has an
2 amino acid sequence as depicted in SEQ ID NO:4 (Figure 2).

1 3. An isolated nucleic acid according to claim 2, which has a nucleotide
2 sequence as depicted in SEQ ID NO:3 (Figure 2).

1 4. A vector comprising the nucleic acid according to claim 1, wherein said
2 sequence that encodes NRIF3 is operatively associated with an expression control sequence.

1 5. The vector according to claim 4 which is a plasmid.

1 6. A cell transfected with the vector according to claim 4.

1 7. The cell according to claim 6 which is a eukaryotic cell.

1 8. The cell according to claim 7, which is a yeast cell.

1 9. A method for producing NRIF3 comprising culturing the cell according to
2 claim 6 under conditions that permit expression of NRIF3.

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1 10. A nucleic acid of at least twenty bases hybridizable under stringent
2 conditions with a nucleic acid having a sequence as depicted in SEQ ID NO:3 (Figure 2).

1 11. An isolated functional NRIF3 nuclear hormone receptor co-activator,
2 wherein the NRIF3 binds in a ligand dependent manner to thyroid hormone receptor (TR) and
3 retinoid X receptor (RXR), but does not interact with retinoic acid receptor (RAR), vitamin D
4 receptor (VDR), progesterone receptor (PR), glucocorticoid receptor (GR), and estrogen
5 receptor (ER) in a yeast two hybrid assay system or *in vitro*, or both, which polypeptide contains
6 an LxxIL (SEQ ID NO:2) module in its C-terminal domain.

1 12. The isolated NRIF3 according to claim 11, wherein said NRIF3 has an
2 amino acid sequence as depicted in SEQ ID NO:4 (Figure 2).

1 13. An antibody that specifically binds to the NRIF3 according to claim 11.

1 14. The antibody according to claim 13 which is a polyclonal antibody.

1 15. A test system comprising the recombinant cell of claim 7, wherein the cell
2 expresses a thyroid hormone receptor or a retinoid X receptor.

1 16. The test system according to claim 15, wherein the cell further comprises a
2 reporter gene under control of an expression sequence modulated by NRIF3.

1 17. The test system of claim 16, wherein the reporter gene is selected from the
2 group consisting of green fluorescent protein, lacZ, cat, and luciferase.

1 18. A method for identifying a compound that modulates thyroid hormone
2 receptor or retinoid X receptor, which method comprises detecting modulation of expression of
3 the reporter protein in the system of claim 16 by the cell contacted with the compound.

1 19. A method for identifying a compound that modulates NFIR3 interaction
2 with nuclear hormone receptor, which method comprises detecting modulation of interaction of
3 NFIR3 and TR or RXR in the presence of the compound.

1 20. The method according to Claim 19, wherein modulation of interaction
2 occurs in a yeast two-hybrid system.